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REMARKS

Status of the Claims

The undersigned hereby confirms the election of Group I, claims 1-23, and requests cancellation of claims 24-51 with specific reservation to pursue the subject matter of the cancelled claims in a divisional or other continuing application.

After entry of this amendment claims 1-23 will be pending. Claim 23 has been allowed, and claims 2-6, 8-11, and 18-21 are objected to. Claims 1, 7, 12-17, and 22 stand rejected. The Applicants sincerely thank the Examiner for allowing claim 23, and for indicating the allowability of claims 2-6, 8-11, and 18-21.

Claims 2, 5, 8, 18, 19, 20, and 21 have been rewritten in independent form in accordance with the Examiner's indication of allowability on page 4 of the Office action. The Applicants believes these amendments overcome the objections to these claims in a self-evident manner. Claim 6 has been amended to change dependency. The undersigned believes these amendments to the claims do not add new matter.

The written description has been amended to include application serial numbers of co-pending patent applications that were not available at the time of filing, and to correct a typographical error. The undersigned believes these amendments to the written description do not add new matter.

The undersigned thanks the Examiner for his advisement concerning the obligation under 37 CFR 1.56 to point out the inventors and invention dates of each claim that was not commonly owned at the time a later invention was made. The undersigned believes all claims were commonly owned at the time a later invention was made.

Rejections under 35 U.S.C. §102

Claims 1 and 22 stand rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent Application Publication No. US 2002/0017834 A1 by MacDonald (hereinafter "MacDonald"). The Examiner cites MacDonald for disclosing an actuated MEMS device comprising a base portion of a die, a pivoting member with a hinge, a mirror having a mirror surface essentially parallel to the major surface, the mirror being integrated with the pivoting member; and an actuator disposed to rotate the pivoting member to move the

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mirror from a first switch position to a second switch position. The Applicants respectfully traverse the Examiner's position.

Claims 1 and 22 recite, among other elements, that the pivoting member rotates in relation to the base portion about an axis essentially perpendicular to a major surface of the die. The major surface 57 of the die (cell) 10 is shown in Fig. 1C of the instant patent application. The pivoting member 14 rotates about an axis essentially perpendicular to the major surface 57, in other words, the pivoting member 14 rotates in a plane parallel to the major surface. In comparison, the actuated MEMS element 1110 shown in Figs. 11a and 11b of MacDonald appears to rotate around an axis parallel to the major surface of the substrate 1120, *i.e.* the axis of rotation appears to lie along the beam 1115, which is parallel to the major surface. The MEMS element 1110 is shown as being essentially parallel to the major surface of the substrate 1120 in Fig. 11a, and as having been rotated out of the plane of the major surface of the substrate in Fig. 11b. MacDonald does not disclose or suggest the axis of rotation recited in claims 1 and 22; therefore, the Applicants believe that claims 1 and 22, and all claims that depend from claims 1 and 22, are allowable.

Claims 1, 7, 12-15, and 22 stand rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent Application Publication No. US 2001/0050801 by Behin et al. (hereinafter "Behin"). The Examiner cites Behin for disclosing a MEMS device comprising a base portion of a die, a pivoting member with a hinge, a mirror having a mirror surface essentially parallel to the major surface, the mirror being integrated with the pivoting member; and an actuator disposed to rotate the pivoting member to move the mirror from a first switch position to a second switch position. The Examiner also cites Behin for a mirror including a magnetic rib that is a thicker portion of the mirror, and a single-crystal silicon layer having a thickness of 50 microns. The Applicants respectfully traverse the Examiner's position.

Claims 1 and 22 recite, among other elements, that the pivoting member rotates in relation to the base portion about an axis essentially perpendicular to a major surface of the die, in other words, the pivoting member 14 rotates in a plane parallel to the major surface 57 of the die 10 shown in Fig. 1C of the instant patent application. In comparison, the rotating element 24 shown in Fig. 2 of Behin is attached to the substrate 27 by a rotatable flexure 25 disposed along an axis 30. Referring to Fig. 3 of Behin, the axis 30 appears to

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lie in the plane of the major surface of the substrate 27. The rotation appears to angularly displace the rotating element from the major plane of the substrate. Behin does not disclose or suggest the axis of rotation recited in claims 1 and 22; therefore, the Applicants believe that claims 1 and 22, and all claims that depend from claims 1 and 22, are allowable.

Claim 15, which depends from claim 1 through claim 12, recites that the mirror comprises a thin section and a rib section, the rib section being thicker than the thin section. The Examiner states that the mirror disclosed in Behin also includes a magnetic rib. The Applicants respectfully traverse the Examiner's position. In paragraph [0033] Behin states that a magnetic material may be deposited on the rotation element 24 to act as a biasing element 26 when placed in an external magnetic field. In paragraph [0039] Behin states that the rotating element may include reflective or light deflective surfaces, so as to provide a beam steering or scanning mirror. Referring to Fig. 2 of Behin, the Applicants believe that the magnetic rib cited by the Examiner is not likely to be part of the mirror, but rather next to the mirror. Thus, the Applicants believe claim 15 is further patentable.

Rejections under 35 U.S.C. §103

Claims 16 and 17 stand rejected as being unpatentable over Behin. The Examiner states that Behin fails to disclose a thickness of the rib section being 40 microns, and the thinner section of the mirror being 20 microns, and further states that achieving optimum thickness for the mirror and rib sections would require routine experimentation. The Examiner states that, lacking criticality in the specification, the ordinary artisan would have found it to be obvious at the time of the invention to achieve optimum thickness for the mirror and rib section performing routine experimentation. The Applicants respectfully traverse the Examiner's position.

In order to optimize a variable, it must first be recognized as a result effective variable. The Applicants teach that the mirror can be thinned to reduce the mass of the mirror, but that excessive thinning of a relatively large mirror reduces mirror stiffness, which can result in distortion (page 17, lines 21-23). The Applicants further teach that a mirror can be reinforced with ribs, which stiffen the thinner mirror segments (page 17, lines 27-28).

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In contrast, Behin shows biasing elements 26 near the edge of the rotating element 24. As discussed above in support of claim 15, the biasing elements 26 appear to be separate from the mirror, not part of the mirror. If one were to optimize the thickness of the biasing elements 26 in light of Behin, they would be optimized for their biasing effect, not to stiffen the mirror. There is no disclosure or suggestion to make the biasing elements twice as thick as the thinner portion of the mirror, and no recognition that ribs may be added to the mirror to stiffen it to reduce distortion.

The Applicants respectfully assert that the written description provides criticality, namely that a rib section of a mirror that is twice as thick as a thin section of a mirror enables a relatively large mirror with lower mass, yet retaining sufficient stiffness to avoid distortion. Accordingly, the Applicants believe that claims 16 and 17 are further patentable.

CONCLUSION

In view of the foregoing, the Applicants believe that upon entry of this amendment all claims pending in this Application will be in condition for allowance. The Applicants respectfully request entry of this Amendment, reconsideration of the amended claims, withdrawal of the rejections, and the issuance of a formal Notice of Allowance at an early date.

If the Examiner believes this amendment does not put all pending claims in condition for allowance, the undersigned respectfully requests a telephone interview to expedite prosecution of this application, and invites the Examiner to telephone the undersigned at (707) 591-0789.

Respectfully submitted,



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